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ABSTRACT

One of 15 core modules in a 22-module series designed to train vocational education curriculum specialists (VECS), this guide is intended for use by both instructor and student in a variety of education environments, including independent study, team teaching, seminars, and workshops, as well as in more conventional classroom settings. The guide has five major sections. Part I, Organization and Administration, contains an overview and rationale, educational goals and performance objectives, recommended learning materials, and suggested reference materials. Part II, Content and Study Activities, contains the content outline arranged by goals. Study activities for each goal and its corresponding objectives follow each section of the content outline. The content focus is on the performance of the necessary preparatory steps for systematic derivation of instructional objectives (job description, task analysis, target population, etc.) and the specification of instructional objectives. Part III, Group and Classroom Activities, suggests classroom or group activites and discussions keyed to specific content in the outline and to specific materials in the list of references. Part IV, Student Self-Check, contains questions directly related to the goals and objectives of the module, which may be used as a pretest or posttest. Part V, Appendix, contains suggested responses to the study activities from part II and responses to the student self-checks. (HD)

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VOCATIONAL EDUCATION CURRICULUM SPECIALIST

VECS

ED132409

Module 7:

Derivation and Specification of Instructional Objectives

STUDY GUIDE

(TEACHING/LEARNING MODULE)

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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-Study Guide-

Module 7

DERIVATION AND SPECIFICATION OF INSTRUCTIONAL OBJECTIVES

This document is one of a series of teaching/learning modules designed to train Vocational Education Curriculum Specialists. The titles of all individually available documents in this series appear below:

INTRODUCTORY MODULES

1. The Scope of Vocational Education
2. Roles of Vocational Educators in Curriculum Management
3. Current Trends in Vocational Education
4. Organization of Vocational Education
5. Legislative Mandates for Vocational Education
6. The Preparation of Vocational Educators

CORE MODULES

1. Important Differences Among Learners
2. Learning Processes and Outcomes
3. Applying Knowledge of Learning Processes and Outcomes to Instruction
4. Assessing Manpower Needs and Supply in Vocational Education
5. Laying the Groundwork for Vocational Education Curriculum Design
6. Selecting Instructional Strategies for Vocational Education
7. Derivation and Specification of Instructional Objectives
8. Development of Instructional Materials
9. Testing Instructional Objectives
10. Fiscal Management of Vocational Education Programs
11. Introducing and Maintaining Innovation
12. Managing Vocational Education Programs
13. Basic Concepts in Educational Evaluation
14. General Methods and Techniques of Educational Evaluation
15. Procedures for Conducting Evaluations of Vocational Education

SEMINARS AND FIELD EXPERIENCE MODULE

(Seminars in Authority Roles and the Curriculum Specialist in Vocational Education, and Leadership Styles and Functions of the Curriculum Specialist in Vocational Education; field work in Project Design and Administration, Operation of School Programs, Evaluation of School Programs, Educational Research and Development, and State, Regional, and Federal Program Supervision)

INSTALLATION GUIDE

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PREFACE

Who is a vocational education curriculum specialist? The answer to this question is not as simple as it might appear. A vocational education curriculum specialist is likely to work in many different capacities, including, but not limited to: instructor, department chairperson, dean of vocational-technical education, vocational supervisor, principal, state or local director of vocational education, and curriculum coordinator.

The specialist is, perhaps, more identifiable by his/her responsibilities, which include, but are not limited to:

- planning, organizing, actualizing, and controlling the work of an educational team performed to determine and achieve objectives.
- planning, organizing, and evaluating content and learning processes into sequential activities that facilitate the achievement of objectives.
- diagnosing present and projected training needs of business, industry, educational institutions, and the learner.
- knowing, comparing, and analyzing different theories of curriculum development, management, and evaluation and adapting them for use in vocational-technical education.

This teaching/learning module is part of a set of materials representing a comprehensive curriculum development project dealing with the training of vocational education curriculum specialists. The purpose of this two-year project was 1) to design, develop, and evaluate an advanced-level training program, with necessary instructional materials based on identified vocational education curriculum specialist competencies, and 2) to create an installation guide to assist instructors and administrators in the implementation process.

The curriculum presented here is, above all else, designed for flexible installation. These materials are not meant to be used only in the manner of an ordinary textbook. The materials can be used effectively by both instructor and student in a variety of educational environments, including independent study, team teaching, seminars, and workshops, as well as in more conventional classroom settings.

Dr. James A. Dunn
Principal Investigator and
presently Director,
Developmental Systems Group
American Institutes for Research

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The Vocational Education Curriculum Specialist Project was a comprehensive development and evaluation effort involving the contribution of a large number of people: project staff, curriculum consultants, a national advisory panel, and a number of cooperating colleges and universities. This wide variety of valuable inputs makes it difficult to accurately credit ideas, techniques, suggestions, and contributions to their originators.

The members of the National Advisory Panel, listed below, were most helpful in their advice, suggestions, and criticisms.

Myron Blee	*Florida State Department of Education*
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Ben Hirst	*Director, Consortium of the States, Atlanta, Georgia*
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Rita Richey	*Wayne State University*
Bryl R. Shoemaker	*Ohio State Department of Education*
William Stevenson	*Oklahoma State Department of Education*

The project would not have been possible without the cooperation and commitment of the field test institutions listed below.

California State University, Long Beach
California Polytechnic State University, San Luis Obispo
Consortium of California State University and Colleges
- California State University, Sacramento
- California State University, San Diego
- California State University, San Francisco
- California State University, San Jose
- California State University, Los Angeles

Iowa State University
University of California Los Angeles
University of Northern Colorado

Overall responsibility for the direction and quality of the project rested with James A. Dunn, Principal Investigator. Project management, supervision, and coordination were under the direction of John E. Bowers, Project Director.

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Part I:

Organization and Administration

PART I
ORGANIZATION AND ADMINISTRATION

Guidelines

This study guide has five major sections. Each section contains useful information, suggestions, and/or activities that assist in the achievement of the competencies of a Vocational Education Curriculum Specialist. Each major section is briefly described below.

PART I: ORGANIZATION AND ADMINISTRATION

PART I contains an Overview and Rationale, Educational Goals and Performance Objectives, Recommended Learning Materials, and Suggested Reference Materials. This section will help the user answer the following questions:

- How is the module organized?
- What is the educational purpose of the module?
- What specifically should the user learn from this module?
- What are the specific competencies emphasized in this module?
- What learning materials are necessary?
- What related reference materials would be helpful?

PART II: CONTENT AND STUDY ACTIVITIES

Part II contains the content outline arranged by goals. The outline is a synthesis of information from many sources related to the major topics (goals and objectives) of the module. Study activities for each goal and its corresponding objectives follow each section of the content outline, allowing students to complete the exercises related to Goal 1 before going on to Goal 2.

PART III: GROUP AND CLASSROOM ACTIVITIES

The "Activities-Resources" column in the content outline contains references to classroom or group activities and discussion questions related to specific content in the outline. These activities and discussion questions

are located in PART III and are for optional use of either the instructor or the student. Both the classroom activities and discussion questions are accompanied by suggested responses for use as helpful examples only--they do not represent conclusive answers to the problems and issues addressed. Also contained in the "Activities-Resources" column are the reference numbers of the resources used to develop the content outline. These reference numbers correspond to the numbers of the Suggested Reference Materials in PART I.

PART IV: STUDENT SELF-CHECK

PART IV contains questions directly related to the goals and objectives of the module. The self-check may be used as a pre-test or as a post-test, or as a periodic self-check for students in determining their own progress throughout the module.

PART V: APPENDICES

Appendix A contains responses to the Study Activities from PART II, and Appendix B contains responses to the Student Self-Check. The responses provide immediate feedback to the user and allow the module to be used more effectively for individualized study. They have been included in the last part of the module as appendices to facilitate their removal should the user wish to use them at a later time rather than concurrently with the rest of the module.

Approximately 30 hours of out-of-class study will be necessary to complete this module.

Overview and Rationale

The literature on objectives is filled with a variety of terms that seem to mean essentially the same thing. Such terms include: "instructional objective," "learning objective," "performance objective," "behavioral objective," "measurable objective," "operational objective," and possibly others. Very often the particular term used represents author preference rather than a basic difference in meaning among the terms.

This module uses the term "instructional objective," referring to the type of objective that attempts to define exactly what, how well, and under what circumstances a student will be able to perform as a result of instruction.

One of the important competencies a curriculum specialist must possess--and the competency to which this module is addressed--is the ability to specify instructional objectives in measurable terms. To be effective, the curriculum specialist must interpret broad educational goals in ways that communicate the intent of a course (or an instructional unit) to all concerned--students, teachers, administrators, parents, etc.

Objectives in vocational education exist at a variety of levels: national, state, institutional, program, and classroom. This module is concerned with objectives at the classroom level--specifically, with the objectives for a course or a unit of instruction. These objectives represent the "blueprint" of student performance, describing what the student should be able to do at the end of a course or upon completion of an instructional unit.

This module deals with two general activities associated with objectives: derivation and specification. Derivation concerns procedures both for identifying possible objectives for instruction and for deciding which objectives ought to be accepted. These procedures include: the location or development of a general job description; task analysis; the selection of tasks for instruction; description of the target population; and determination of course prerequisites. Specification refers to the process of writing good objectives and the process of selecting the content to be included in them. This detailed content usually includes: a statement of the specific behavior expected of the student upon completion of instruction; the important conditions under which student behavior is to occur (givens or restrictions, or both); and the criteria or standards of acceptable performance.

This module represents the first in a series of three modules on the development of instruction for vocational education. It discusses procedures for identifying possible objectives for instruction and

procedures for actually writing such objectives. The next module in the series, Module 8, describes the process of developing instruction to accomplish these objectives. And, finally, Module 9 discusses the means of assessing student achievement of the objectives of instruction.

A variety of approaches to instructional development are in practice in vocational education today. They include: the integrated approach; the occupational or job analysis approach; the clusters, families, or common elements of occupations approach; the functions of industry approach; and the concept approach. (Each of these is briefly described in Introductory Module 2: Roles of Vocational Educators in Curriculum Management.)

This series of modules on instructional development follows an occupational or job analysis approach because it is the most common and is often used in combination with other curriculum techniques.

Goals and Objectives

Upon completion of this module, the student will be able to achieve the following goals and objectives:

GOAL 7.1: PERFORM THE NECESSARY PREPARATORY STEPS FOR SYSTEMATIC DERIVATION OF INSTRUCTIONAL OBJECTIVES.

Objective 7.11 Locate or write a job description for a given occupation.

Objective 7.12 List and detail the tasks for a given occupation.

Objective 7.13 Select given occupational tasks for school instruction.

Objective 7.14 Determine the major characteristics of the target population.

Objective 7.15 Determine course prerequisites.

GOAL 7.2: SPECIFY INSTRUCTIONAL OBJECTIVES.

Objective 7.21 State the importance of specifying instructional objectives.

Objective 7.22 Given one component of an instructional objective, identify whether that component describes: 1) the target audience; 2) the specific behavior or performance expected of the student as a result of instruction; 3) the conditions under which the student is expected to behave or perform; 4) the standards or criteria of acceptable performance.

Objective 7.23 Given tasks for a specific occupation, develop instructional objectives for these tasks.

Objective 7.24 List five sources for obtaining existing objectives.

Recommended Materials

1. Mager, Robert F., and Beach, Kenneth M., Jr. Developing Vocational Instruction. Belmont, California: Fearon Publishers, 1967.

2. Mager, Robert F. Preparing Instructional Objectives. Belmont, California: Fearon Publishers, 1962.

Suggested References

1. Ammerman, Harry L. Development of Procedures for Deriving Training Objectives for Junior Officer Jobs. Fort Bliss, Texas: Human Resources Research Organization, Division No. 5 (Air Defense), May 1966.

2. Ammons, M. "Objectives and Outcomes." Encyclopedia of Educational Research. 4th ed. New York: Macmillan Company, 1969.

3. Bloom, Benjamin S., ed. Taxonomy of Educational Objectives. New York: David McKay Company, 1967.

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6. Byers, Edward E., and Huffman, Harry H. Writing Performance Goals: Strategy and Prototypes. New York: McGraw-Hill, 1971.

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18. Krathwohl, David R. et al. "Stating Objectives Appropriately for Program, for Curriculum, and for Instructional Material Development." Journal of Teacher Education 16 (1965).

19. Larson, Milton, and Valentine, Ivan. Vocational Education Curriculum Development Handbook. Fort Collins, Colorado: Department of Vocational Education, Colorado State University, January 1974.

20. Lindvall, C. M., ed. Defining Educational Objectives. A report of the Regional Commission and the Learning Research and Development Center. Pittsburgh: University of Pittsburgh Press, 1964.

21. Mager, Robert F. Preparing Instructional Objectives. Belmont, California: Fearon Publishers, 1962.

22. Mager, Robert F., and Beach, Kenneth M., Jr. Developing Vocational Instruction. Belmont, California: Fearon Publishers, 1967.

23. Melching, William H., and Borcher, Sidney D. Procedures for Constructing and Using Task Inventories. Columbus, Ohio: The Center for Vocational and Technical Education, The Ohio State University, March 1973.

24. Popham, W. James. The Uses of Instructional Objectives: A Personal Perspective. Belmont, California: Fearon Publishers, 1973.

25. Popham, W. James, and Baker, Eva L. Systematic Instruction. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1970.

26. Pucel, David J., and Knaak, William C. Individualizing Vocational and Technical Instruction. Columbus, Ohio: Charles E. Merrill Publishing Company, 1975.

27. Tracey, W. R.; Flynn, E. B. Jr.; and Legere, C. L. J. "Systems Thinking for Vocational Education." Educate (November 1968).

28. Tyler, Ralph. Basic Principles of Curriculum and Instruction. Chicago: University of Chicago Press, 1950.

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30. University of California; Division of Vocational Education. Principles of Curriculum in Vocational Education: Reference and Work Book for Trade and Technical Teacher Education. Los Angeles: University of California, 1971.

Part II:

Content and Study Activities

PART II
CONTENT AND STUDY ACTIVITIES

Goal 7.1

Content Outline	Activities-Resources
Goal 7.1: Perform the Necessary Preparatory Steps for Systematic Derivation of Instructional Objectives.	
A. Job Description	
1. Vocational instruction is keyed to occupations and jobs. Therefore, instructional objectives must also be derived from jobs.	(26) Individualizing Vocational and Technical Instruction, Chap. 4.
2. In order to determine the instructional objectives that a student should achieve to ensure successful performance on the job, it is first necessary to define the job clearly (26).	(5) Instructional Systems Development for Vocational and Technical Training, pp. 73-74.
3. A general job description provides the basis for a detailed task analysis which, in turn, provides the basis for the development of instructional materials.	(12) Occupational Analysis, Techniques and Procedures, pp. 33-37.
4. Job descriptions vary in format according to the source. However, the usual components are:	* See Classroom Activity 1 in Part III.
a. location and general working conditions;	* See Discussion Question A in Part III.
b. a general statement of job functions and relationship;	
c. general duties;	
d. possible contingent responsibilities;	
e. simply stated job tasks (5), (12).**	

B. Task Analysis

1. A task analysis is the basis for vocational instruction. The process involves starting with the basic job and breaking it down into successively more detailed components or levels. The purpose of the process is to obtain an adequate definition of the job so that effective instructional objectives and learning activities can be devised to teach the occupation to a willing student.*
2. The curriculum specialist must be trained to recognize the least detailed level to which a task analysis should be taken so that effective instruction will result and unnecessary task detailing avoided. The curriculum specialist's perception of community needs, and his estimation of the capabilities of his staff to design the necessary instruction, will likely be the primary factors in his decision.
3. Many systems exist for performing a task analysis--from simple ones to sophisticated and extremely complex ones. The curriculum specialist will probably find a system between the two extremes to be most useful (22).
4. A first step in performing a task analysis is to locate any existing task analyses for the occupation under consideration. This involves searching publications, indexes, catalogs, and other references. Possible sources for task analyses include: (23)

* See Discussion Question B in Part III.

(22) Developing Vocational Instruction, Chap. 3, describes a system of task analysis designed for the practicing curriculum specialist. See also: (26) Individualizing Vocational and Technical Instruction, Chap. 4. See also: (23) Procedures for Constructing and Using Task Inventories. See also: (12) Occupational Analysis Techniques and Procedures.

(23) Procedures for Constructing and Using Task Inventories, Chap. 2.

a. Abstracts of Instructional Materials in Vocational and Technical Education (AIM). This document includes abstracts of materials typically designed for teacher or student use in the classroom, and annotations of bibliographic or instructional materials for vocational and technical education.

b. Abstracts of Research and Related Materials in Vocational and Technical Education (ARM). This document incorporates abstracts of research and other materials that are useful to persons who have an interest in vocational and technical education, such as researchers, supervisors, teacher educators, education specialists, administrators, teachers, and others.

c. Publications of the American Association of Junior Colleges (Washington, D.C.: American Association of Junior Colleges, 1970). This current list of publications of the AAJC includes guidelines for program planners, facility guides, curriculum guides, and a wide variety of assorted publications useful to those responsible for initiating and conducting postsecondary vocational and technical education programs.

d. The U.S. military is a good source of task statements. An additional source of both military and civilian task analyses is the Human Resources Research Organization.*

* Contact: 1) Personnel Research Laboratory, Lackland Air Force Base, Texas 78236; or 2) Headquarters, U.S. Marine Corps, Office of Manpower Utilization (A Field Activity, G-1 Division), Marine Corps Development and Education Command, Quantico, Virginia 22134; or 3) Human Resources Research Organization, 300 North Washington Street, Alexandria, Virginia 22314.

e. The Center for Vocational and Technical Education at the Ohio State University has some task statements. These are available through the Educational Resources Information Center (ERIC) system.

f. Many curriculum guides contain some type of task analysis or job analysis. These vary in detail and completeness, but they can be useful.

5. If job tasks for a specific occupation do not exist, the curriculum specialist will need to go into the community and obtain this information from:

a. people currently employed in the job; and

b. people employed one level above the job who are very familiar with it and who supervise people working at it.*

* See Discussion Question C and Classroom Activity 2 in Part III.

C. Selection of Tasks for Instruction

1. Once all the job tasks have been determined, it is necessary to decide for which tasks instruction should be provided. In some cases, a task is better learned on the job than in the classroom.

2. Different authors suggest various criteria for selecting tasks for instruction. (The military criteria are provided on page 28 of this guide.)

3. Another author, Ammerman, suggests that the following factors be considered when selecting tasks for instuction: (1)

(1) Development of Procedures for Training Objectives for Junior Officer Jobs.

a. how often each task is performed by a jobholder;
b. how often each task should be performed;
c. proportion of jobholders concerned with each task;
d. importance of each task to effective business operation;
e. existence of a discrepancy between what is done and what should be done by jobholders;
f. how soon task competence is expected after job assignment;
g. tasks for which all essential learning can be, and is being, adequately acquired on the job in the time available;
h. tasks for which all essential learning has occurred prior to school attendance;
i. tasks for which jobholders are having difficulty acquiring competence on the job;
j. tasks for which training difficulties are being experienced;
k. tasks for which procedures could be improved through school training efforts.*

* See Discussion Question D in Part III.

D. Description of Target Population

1. Once the details of a job have been determined and the job tasks to be taught have been selected, it is important next to determine the characteristics of the students to be instructed.

2. Ralph Tyler, who has provided a great deal of important material on curriculum in his writings, has pointed out the learner as one of the major sources of data from which instructional objectives may be constructed (28).

(28) Basic Principles of Curriculum and Instruction, Chap. 1.

3. Reasons for determining learner abilities and interests:
   a. to decide what student is likely to know already;
   b. to decide what motivates students;
   c. to use learner abilities and interests as a guide in developing instruction.*

* See Discussion Question E in Part III.

4. Tyler suggests several methods to determine what students are interested in learning.
   a. Interview students directly, asking them what they think they should be doing.
   b. Have students fill out questionnaires, expressing their interests.
   c. Carefully observe students in the classroom.

E. Course Prerequisites

1. According to Pucel and Knaak, prerequisites are those things which an instructor assumes a student will bring with him to a learning situation....Prerequisites can be classified as general course prerequisites and specific task prerequisites. General course prerequisites are those which are necessary for a per-

son to perform to accomplish most of the tasks contained in the course. Specific task prerequisites are those which are relatively unique to a particular task (26).

2. If a student does not possess the prerequisites necessary to a given course, chances are that he will not be able to benefit fully from the learning experience. Therefore, methods must be developed which assess whether a student possesses the prerequisites necessary to benefit from instruction (26).
3. An instructor may be able to assess student abilities through prerequisites tests, or he may have to rely on specialists.*

(26) Individualizing Vocational and Technical Instruction, Chap. 3.

* See Classroom Activity 3 in Part III.

F. Study Activities

Based on your reading of the content outline and any additional references as suggested, complete the following activities.

Job Description

Since the purpose of vocational education programs is to prepare students for employment, the first step in instructional development following an occupational or job analysis approach is to locate or write a job description. The description should be a general statement of what a person does when performing the job, and it should tell something about the conditions under which he does them.

In many cases, you will be able to locate a job description in the Dictionary of Occupational Titles, a publication developed and prepared by the U. S. Employment Service for individuals concerned with the use of occupational information in vocational, personnel, and related services and activities. The DOT consists of two volumes: Volume I lists each occupation and describes it in terms of the activities performed; Volume II arranges worker trait groups alphabetically, thus enabling a person to identify occupations by inspecting various kinds of activities.

The DOT groups occupations into nine broad categories:

0, 1 Professional, technical, and managerial occupations
2 Clerical and sales occupations
3 Service occupations
4 Farming, fishery, forestry, and related occupations
5 Processing occupations
6 Machine trades occupations
7 Bench work occupations
8 Structural work occupations
9 Miscellaneous occupations

These broad categories, in turn, are divided into divisions and then into groups. The divisions and groups are based primarily on type of activity or product.

Each occupational title that appears in the DOT has a code number which reflects these broad categories, divisions, and groups. Below is an example of a job description from the DOT for the occupation of cabinet maker.

CABINET MAKER 660.280

Constructs and repairs wooden articles, such as store fixtures, office equipment, cabinets, and high-grade furniture, using woodworking machines and handtools. Studies blueprints or drawings of articles to be made. Marks outline or dimensions of parts on paper or lumber stock, according to blueprint or drawing specifications. Matches materials for color, grain, or texture. Sets up and operates such woodworking machines as power saws, jointer, mortiser, tenoner, molder, and shaper to cut and shape parts from stock (MILLMAN). Trims component parts of joints to make them fit snugly, using handtools, such as planes, chisels, or wood files. Bores holes for insertion of screws or dowels by hand or by use of boring machine. Glues, fits, and clamps parts and sub-assemblies together to form complete unit, using clamps or clamping machine. Drives nails or other fasteners into joints at designated places to reinforce them. Sands and scrapes surfaces and joints of articles to prepare them for finishing. (etc.)

One note of caution: The DOT does not reflect all possible jobs. With advancing technology and the rapid occupational change in society, jobs are constantly becoming obsolete while new jobs are being created. Also, most of the jobs in the DOT are defined in broad, all-inclusive terms. Therefore, not all definitions can be expected to coincide exactly with specific jobs in a particular establishment or in a given locality. To have the greatest local applicability, the job definitions should be supplemented with information concerning specific jobs in the community.

When you are unable to locate a job description in the DOT, you will have to seek another source or write the job description yourself.

1. Read Chapter 2: "Job Description" in Mager and Beach, Developing Vocational Instruction. Then complete the following activity.

   Select an occupation that falls under one of the seven vocational education program areas: agricultural education, distributive education, health occupations, home economics, office occupations, technical education, trades and industry. Then write a job description for that occupation. In selecting an occupation, you might consider one with which you are particularly familiar or one at which you have actually worked. Think about doing the job, and list the various tasks that are involved. Also list any special or unusual conditions under which the task is carried out.

2. Go to a nearby library and locate a copy of the Dictionary of Occupational Titles. See if you can find a job description for the occupation you described in Exercise 1. If you are able to locate a description, how does it compare with the one you wrote? If you are not able to locate a description, how might you explain the fact that it does not appear in the DOT?

   Task Analysis

   The second step in instructional development for vocational education is to expand the job description by specifying tasks that an employer would normally expect from an employee engaged in doing the job. A task generally requires some combination of skills and knowledge, as well as both physical and mental action on the part of the worker. Each task has a definite starting and stopping point; each is the smallest unit of job activity having a specific purpose. A job may consist of only one task or it may be composed of a series of interdependent tasks. In the latter case, the tasks normally must be completed in proper sequence if the job is to be done satisfactorily. Tasks, then, are the step-by-step process of completing a job. The process of determining these tasks is called task analysis.

   According to Mager and Beach, "There are probably as many techniques for performing a task analysis as there are people doing it." Such

techniques range from the very simple to the highly sophisticated (and the very time-consuming). Since vocational educators rarely have large amounts of time and resources for curriculum development, however, the practicality of the work situation will determine the task analysis technique to be used. The technique described by Mager and Beach is appropriate for the practicing vocational educator.

3. Read Chapter 3: "Task Analysis" in Mager and Beach, Developing Vocational Instruction. Then complete the following activity.

   Using the job description you wrote for Exercise 1, list all the tasks that might be included in the job. (If you have time, talk with someone actually working at the job; then watch this individual doing the job.) List all these tasks on the Task Listing Sheet on page 20 of this guide. For each task, indicate the frequency of performance, importance, and learning difficulty. When you have completed the Task Listing Sheet, answer the following questions.

   a. Did you find the Task Listing Sheet an easy form to use? If not, how would you change it?
   b. Have you ever used a form for task listing that you found particularly effective? If so, diagram that form. Be prepared for a class discussion in which you describe the advantages of this form.

TASK LISTING SHEET

Vocation: _____

No.	Task	Frequency of Performance	Importance	Learning Difficulty

The Task Statement: Action Verb, Object, and Qualifier

Perhaps you noticed when completing the Task Listing Sheet that the job tasks you described focused on a variety of action verbs. A performance task usually generates a product or an observable change in the work environment. A job task statement, therefore, should begin with an action verb in order to indicate what a person does on the job. The action verb is then followed by the object--the element which is acted upon. The object is followed by a qualifier, when applicable. The use of a qualifying phrase is optional but is desirable whenever needed to make a task statement more specific. Qualifiers may limit an action to a specific procedure or process or may identify a specific component or area of an object.

The task statements for a painter, for example, are broken into action verbs, objects, and qualifiers as shown here.

Action Verb	Object	Qualifier
Refinishes	old and new surfaces	
Selects	finishing material	
Selects	appropriate brushes and rollers	
Removes	trim and obstacles	before finishing
Removes	existing finish from surfaces	when appropriate
Fills	cracks and holes	with appropriate substitutes
Mixes and thins	finishing material	to correct consistency
Adds	color to finishing material	when necessary
Selects and supplies	appropriate ground and furniture covering	
etc.		

Some action verbs are most useful when used with a particular type of content such as language behaviors, arts behaviors, and mathematical behaviors. The National College Verb List provided on the following pages presents sample verbs commonly used with different types of content. You may find this list a handy reference whenever you are writing task statements.

NATIONAL COLLEGE VERB LIST (7)

THE FUNCTIONAL, FORCEFUL FOUR HUNDRED FIFTY FIVE

"Creative" Behaviors

Alter	Generalize	Question	Re-group	Re-phrase	Re-write
Ask	Modify	Re-arrange	Rename	Restate	Simplify
Change	Paraphrase	Re-combine	Re-order	Restructure	Synthesize
Design	Predict	Reconstruct	Re-organize	Retell	Systematize
				Revise	Vary

Complex, Logical, Judgmental Behaviors

Analyze	Combine	Contrast	Designate	Formulate	Plan
Appraise	Compare	Criticize	Determine	Generate	Structure
Assess	Conclude	Deduce	Discover	Induce	Suggest
		Defend	Evaluate	Infer	Substitute

General Discriminative Behaviors

Choose	Describe	Discriminate	Indicate	Match	Place
Collect	Detect	Distinguish	Isolate	Omit	Point
Define	Differentiate	Identify	List	Order	Select
				Pick	Separate

Social Behaviors

Accept	Answer	Co-operate	Forgive	Laugh	Reply
Admit	Argue	Dance	Greet	Meet	Smile
Agree	Communicate	Disagree	Help	Participate	Talk
Aid	Compliment	Discuss	Interact	Permit	Thank
Allow	Contribute	Excuse	Invite	Praise	Visit
			Join	React	Volunteer

Language Behaviors

Abbreviate	Call	Indent	Punctuate	Speak	*Tell
Accent	Capitalize	Outline	Read	Spell	Translate
Alphabetize	Edit	Print	Recite	State	Verbalize
Articulate	Hyphenate	Pronounce	Say	Summarize	Whisper
			Sign	Syllabicate	Write

"Study" Behaviors

Arrange	Circle	Diagram	Itemize	Mark	Record

National College Verb List (continued)

Categorize	Classify	Find	Label	Name	Reproduce
Chart	Compile	Follow	Locate	Note	Search
Cite	Copy	Gather	Look	Organize	Sort
			Map	Quote	Underline
		Music Behaviors			
Blow	Clap	Finger	Hum	Pluck	Strum
Bow	Compose	Harmonize	Mute	Practice	Tap
			Play	Sing	Whistle
		Physical Behaviors			
Arch	Climb	Hit	March	Ski	Swim
Bat	Face	Hop	Pitch	Skip	Swing
Bend	Float	Jump	Pull	Somersault	Throw
Carry	Grab	Kick	Push	Stand	Toss
Catch	Grasp	Knock	Run	Step	Walk
Chase	Grip	Lift	Skate	Stretch	
		Arts Behaviors			
Assemble	Cut	Frame	Hold	Roll	Stamp
Blend	Dab	Hammer	Nail	Rub	Stick
Brush	Dot	Handle	Paint	Sand	Stir
Build	Draw	Heat	Paste	Saw	Trace
Carve	Drill	Illustrate	Pat	Sculpt	Trim
Color	Fold	Melt	Polish	Shake	Varnish
Construct	Form	Mix	Pour	Sketch	Wipe
			Press	Smooth	Wrap
		Drama Behaviors			
Act	Direct	Enter	Imitate	Pantomime	Respond
Clasp	Display	Exit	Leave	Pass	Show
Cross	Emit	Express	Move	Perform	Sit
				Proceed	Turn
		Mathematical Behaviors			
Add	Compute	Estimate	Integrate	Plot	Subtract
Bisect	Count	Extrapolate	Interpolate	Prove	Sum

National College Verb List (continued)

Calculate	Cumulate	Extract	Measure	Reduce	Tabulate
Check	Derive	Graph	Multiply	Solve	Tally
Circumscribe	Divide	Group	Number	Square	Verify
		Laboratory Science Behaviors			
Align	Conduct	Dissect	Keep	Plant	Set
Apply	Connect	Feed	Lengthen	Prepare	Specify
Attach	Convert	Grow	Limit	Remove	Straighten
Balance	Decrease	Increase	Manipulate	Replace	Time
Calibrate	Demonstrate	Insert	Operate	Report	Transfer
				Reset	Weigh
		General Appearance, Health and Safety Behaviors			
Button	Comb	Eat	Fill	Taste	Unzip
Clean	Cover	Eliminate	Go	Tie	Wait
Clear	Dress	Empty	Lace	Unbutton	Wash
Close	Drink	Fasten	Stack	Uncover	Wear
			Stop	Untie	Zip
		Miscellaneous			
Aim	Erase	Hunt	Peel	Scratch	Store
Attempt	Expand	Include	Pin	Send	Strike
Attend	Extend	Inform	Position	Serve	Supply
Begin	Feel	Kneel	Present	Sew	Support
Bring	Finish	Lay	Produce	Share	Switch
Buy	Fit	Lead	Propose	Sharpen	Take
Come	Fix	Lend	Provide	Shoot	Tear
Complete	Flip	Let	Put	Shorten	Touch
Correct	Get	Light	Raise	Shovel	Try
Crease	Give	Make	Relate	Shut	Twist
Crush	Grind	Mend	Repair	Signify	Type
Develop	Guide	Miss	Repeat	Slip	Use
Distribute	Hand	Offer	Return	Slide	Vote
Do	Hang	Open	Ride	Spread	Watch
Drop	Hold	Pack	Rip	Stake	Weave
End	Hook	Pay	Save	Start	Work

4. Now that you know the components of a task statement, go back to the Task Listing Sheet you completed for Study Activity 3 and analyze your task statements. Do they contain an action verb, object, and qualifier if necessary?

   For this activity, transfer your task statements to the form provided on the next page, breaking the statements down into their component parts. If you are not happy with your original statements in Activity 3, rewrite them now. Use the National College Verb List to select a more appropriate action verb if you are not satisfied with your previous selection.

5. Now that you have listed the tasks that make up a given occupation, you must next detail the steps involved in each of these tasks. For this exercise, select one of the tasks from the Task Statements sheet you completed in the last exercise. Then on the form provided on page 27, list each of the steps involved in performing the task. After listing the steps, indicate the learning difficulty of each. If it is likely that the student will be able to perform the task before taking the course, add a symbol (one of your choice) to indicate this. (Leave the "Type of Performance" column blank for now. You will have the opportunity to complete it in Module 8, Development of Instructional Materials.)

TASK STATEMENTS

Vocation: _____

Action Verb	Object	Qualifier

TASK DETAILING SHEET

Vocation: _____

Task: _____

No.	Steps in performing the Task	Type of Performance	Learning Difficulty

Selection of Tasks for Instruction

After detailed information has been collected about the requirements of a job, the next step of instructional development is to select those tasks that are best taught in the school; this means weeding out tasks that are best taught on the job (on-the-job training or OJT) and those that do not require any type of instruction or training.

Judgment is the initial key to selecting tasks for school instruction. In the early stages, the individual who is developing a course must be guided by his own judgment and past experience. Later, as the evaluation process feeds back information on instructional effectiveness, the course can be adjusted more objectively. However, until this feedback occurs, judgments should be made by people who know the curriculum and who know the kind of person likely to succeed in a particular job (27).

The military, having the best organized and largest vocational and technical program maintained by any single establishment anywhere, has specified criteria for the selection of tasks for school instruction. These criteria, adapted for the vocational school setting, are provided here (8).

TASK SELECTION CRITERIA

X - Reasons for Selection: School Instruction

A. Task is performed by large percentage of jobholders.
B. Task is performed frequently.
C. Task is critical to job accomplishment.
D. Task is essential in performance of another task.
E. Task is required immediately upon entry into job.

Y - Reasons for Selection: On-the-Job Training

F. Task is relatively easy to learn.
G. Task is performed infrequently.
H. Task is performed by small percentage of jobholders.

Z - Reasons for Rejection

I. Task can be performed without further instruction.

J. Task is similar to other tasks selected for instruction.

Selecting tasks for school instruction is a process based on judgments as to what is required of a new jobholder within a specific occupation and what pattern will accomplish the total instruction at the lowest cost possible. The criteria listed above are intended to assist in making these judgments. These criteria are illustrative and not all-inclusive; specific cases and local conditions may require additions. A task should be evaluated against all the criteria before a decision is made as to whether the task should be recommended for school instruction, on-the-job-training, or rejection.

Reasons for Selection for School Instruction. It is not necessary for a task to meet all of the selection criteria listed below; however, a task should not be selected for school instruction unless it meets at least one.

A. Task is performed by large percentage of jobholders. Performance of a task by a large number of jobholders is a significant factor in substantiating its selection for school instruction, unless the task is teachable on the job.

B. Task is performed frequently. Although frequency is a factor in selection, some routine, simple tasks are performed so frequently that they are easily learned on the job. Normally, additional criteria should be used to support selection on the basis of frequency.

C. Task is critical to job accomplishment. The more critical the task is to job accomplishment, the more suitable is its inclusion in school instruction. Task criticalness can usually be

determined from job analysis, but the judgment of experienced jobholders and supervisors, obtained through interviews and questionnaires, can also be used to determine it.

D. Task is essential in performance of another task. Although certain tasks may not be appropriate for school instruction, proficiency in their performance may be prerequisite to performing other tasks for which instruction is necessary. For example, the task of disassembling and assembling an item of equipment may very well be delegated to on-the-job training, whereas the tasks of identifying, removing, and replacing defective parts in that item of equipment might be selected for school instruction. In this situation, then, since it is necessary to disassemble the item before defective components can be removed and replaced, the task of disassembly and assembly must be selected for school instruction.

E. Task is required immediately upon entry into job. If performance of the task is necessary immediately upon entry--and other selection criteria also apply--then that task should be selected for school instruction.

Reasons for Selection for On-the-Job Training. The following are criteria for deciding that the task should be learned on the job.

F. Task is relatively easy to learn. Routine, simple tasks fall into this category, as do tasks that can be learned more efficiently in the job environment than the school environment.

G.& H. Task is performed infrequently and task is performed by small percentage of jobholders. Although essential to the job, some tasks are performed too infrequently or by too few jobholders to justify the expense of school instruction.

Reasons for Rejection. The following criteria are reasons for rejecting a task for either instruction or training. Either reason would be sufficient for rejection.

I. Task can be performed without further instruction. Can the average student perform the task adequately without school instruction or on-the-job training? If so, the task should not be selected for either.

J. Task is similar to other tasks selected for instruction. If similar performance requirements exist for different tasks within an occupation, the factor of duplication of instruction becomes significant in determining if the tasks should be chosen for school instruction or on-the-job training. For example, a major item of electronic equipment may contain several power supplies. Although each power supply is different, similar performance requirements for each task involved may allow an individual, trained to perform the task on one or two components, to perform the same task on the other, similar components without further instruction.

School Instruction and On-the-Job Training. In many cases, decisions to instruct a task in school rather than train in it on the job will be relatively simple to make, due to known restrictions on personnel, equipment, facilities, or time. Similarly, many tasks clearly will be within the capabilities of on-the-job training. However, decisions that are not clear cut--for example, decisions that school instruction is desirable but only because it is relatively more efficient than on-the-job training--could be subject to change later. Each task subject to such a marginal decision must be noted so that if constraints on school resources or course length dictate, the task can be converted to an on-the-job training requirement.

6. Using the task statements you formulated for the last two activities and the Army's Task Selection Criteria, complete the Task Selection Sheet on the next page. For each task, determine whether it should be considered for school instruction, on-the-job training, or rejection and why. To indicate your selection, use the appropriate criterion code letter(s) (A through J). If you are uncertain as to whether a given task should be handled by school instruction or on-the-job training, use an asterisk (*). Only when you know the personnel, equipment, facilities, and time available for a given course will you be able to make a final determination.

TASK SELECTION SHEET

Vocation: _____

Task	School Instruction	On-the-job Training	Rejection

Description of Target Population

In addition to analyzing the requirements of the occupation for which you are developing a course of instruction, you must also consider the characteristics of the target population--the students who have enrolled in the course. Obviously, the course you develop for an advantaged, upper socioeconomic level group of students is going to differ from the course you develop for a low income, disadvantaged group. As a smart developer, you will always modify your course to make it consistent with the characteristics of the target group.

In describing the target group, you might consider the following:

1. physical characteristics
2. education
3. motivation
4. interests
5. attitudes, biases, and prejudices
6. specific knowledge, skills, and attitudes relevant to subject of course

7. Read Chapter 4: "Target Population" in Mager and Beach, Developing Vocational Instruction. Then complete the following activity.

   Think of any one vocational course you have taught or observed at the secondary or community college level. Then attempt to describe the major characteristics of the students in this class. Use the categories enumerated by Mager and Beach as a starting point for your description of the target population. If you think of any other bases on which to describe the target group, include them here.

Course Prerequisities

As the characteristics of the target population are determined and the course objectives are developed, the required entering behavior of the students becomes clear. And that is what prerequisites are--those abilities (knowledge, attitudes, and skills) that the instructor assumes the students already possess before they enter the learning situation.

The basic areas of prerequisites for an occupational training course might include: physical characteristics, learning abilities, basic skills, work-related attitudes, and miscellaneous. Under each of these areas, you would list specific characteristics a student would be expected to have upon entering the course. You might use a form like the one provided here.

SAMPLE FORM FOR LISTING COURSE PREREQUISITES (26)

Physical	Learning Ability	Basic Skills	Work-related Attitudes	Other
a. arms b. legs c. sight d. hearing e. speech f. mobility	a. learning speed b. memory c. reaction time d. etc.	a. reading b. writing c. arithmetic d. etc.	a. people b. objects c. safety	

Since any given course may require differing levels of a particular characteristic, it is useful to rate each of the prerequisite characteristics. Such a rating system is illustrated here.

SAMPLE WELDING COURSE PREREQUISITES (26)

Physical	Learning Ability	Basic Skills	Work-related Attitudes
a. arms (5) b. legs (5) c. sight (5) d. hearing (3) e. speech (2) f. mobility (5) etc.	a. learning speed (2) b. memory (3) c. reaction time (4) etc.	a. reading (2) b. writing (2) c. arithmetic (2) etc.	a. people 1. co-workers (3) 2. supervisors (3) b. objects 1. tools (4) 2. materials (3) c. safety (5) etc.

A rating of "5" indicates that the student must have this characteristic well developed in order to succeed in the course. A rating of "1," on the other hand, indicates that the student can succeed in the course with a minimal amount of this characteristic.

Using a form like this to list course prerequisites is advantageous in that it allows you to communicate to counselors, students, and others specifically what you expect of a student before he enters the course.

8. Read Chapter 6: "Course Prerequisites" in Mager and Beach, Developing Vocational Instruction. Then complete the following activity.

   Using the occupation you selected for Activities 1 through 6, complete the Course Prerequisites Form on the following page. Try to determine some of the specific characteristics a student should have upon entering a course that provides training for this occupation. After listing specific characteristics under each column, rate each one as to its degree of importance. (Remember, under normal course development circumstances, you would determine prerequisites as the other steps of course development are carried out.)

(See Appendix A for possible answers.)

COURSE PREREQUISITES FORM

Vocation: _____

Physical Characteristics	Learning Abilities	Basic Skills	Work-related Attitudes

Content Outline	Activities-Resources

Goal 7.2: Specify Instructional Objectives.

A. Importance of Instructional Objectives

1. Many reasons are given in the literature for writing and using measurable instructional objectives.
2. Lindvall states unqualifiedly that: "...Statements of the purposes of education are truly meaningful only when they are made so specific as to tell exactly what a pupil is able to do after he has had a given learning experience" (20).*

(20) Defining Educational Objectives.

* See Discussion Question F in Part III.

3. Gagné restates some of the reasons previously proposed by Tyler for clearness and precision of objectives.
   a. Definitions of objectives are necessary to guide the behavior of the teacher.
   b. Defining objectives for the student provides him with a goal which he himself can use to organize his own learning activities.
   c. Unless the objectives are known, it is impossible to know what the student's capabilities are at any given moment. This reason for objectives has often been stated in terms of requirements for measurement (13).

(13) "The Analysis of Instructional Objectives for the Design of Instruction."

4. The literature shows that objectives are said to be beneficial for very different reasons. They may be used in one or more of these major ways: (14)
   a. to manage instruction;
   b. to manage learning;
   c. to plan instruction;
   d. to enhance learning;
   e. to facilitate evaluation;
   f. to aid in communication with others;
   g. to design or redesign curriculum;
   h. to produce new insights.*
5. There are critics of instructional objectives as well as proponents. Some experts who are equally committed to finding more effective means of instruction and evaluation object to the strategy proposed by proponents of instructional objectives. They worry that teachers and instructional designers will become bogged down at the objective-writing state. A more profitable strategy, they suggest, may be to move directly from vague objectives to test items (11).*
6. Two cautions should be kept in mind in any discussion of instructional objectives:
   a. The claimed effectiveness of precise instructional objectives with regard to their proposed uses remains to be demonstrated. On the other hand, there are no demonstrations that instructional objectives do not lend to the proposed benefits. The issue is simply unresolved at this time.

(14) Behavioral Objectives: A Selected Bibliography and Brief Review

* See Classroom Activity 4 in Part III.

(11) "Behavioral Objectives Are No Damn Good."

* See Classroom Activity 5 in Part III.

b. The mere stating of instructional objectives will not in itself lead to the results indicated in many cases. For example, when authors speak of the use of instructional objectives in evaluation, they are abbreviating the evaluation process. Only in some cases is an instructional objective synonymous with a performance test; more often, test materials must be designed. While objectives may be a first step toward (and a guide in) developing a sound test, the sophisticated test instrument must often be more than a one or two sentence objective.

B. Various Dimensions of Instructional Objectives

1. Instructional objectives vary in a number of characteristics:
   a. components;
   b. kinds;
   c. specificity;
   d. complexity;
   e. time;
   f. comprehensiveness.
2. Components of Objectives. Many authors have written about instructional objectives. However, most define objectives in terms of Mager's three criteria: behavior, conditions, and standards.
3. Kinds of Objectives. Objectives have been categorized by many authors into three major types:

a. Cognitive objectives: emphasis is on knowing, conceptualizing, comprehending, applying, synthesizing, and evaluating.
b. Affective objectives: emphasis is on attitudes, values and emotions.
c. Psychomotor objectives: emphasis is on physical skills and dexterity.

4. Specificity of Objectives. Various levels of specificity for objectives have been described. This subject has been mentioned already. Krathwohl et al. classify objectives in a three-part scheme:
   a. global objectives can be refined into
   b. intermediate objectives (for a course) which in turn can be reduced to
   c. specific objectives, each representing a skill or concept (18).

   Kibler et al. also suggest three levels of objectives:
   a. planning objectives which are very specific;
   b. informational objectives which are abbreviations of planning objectives; and
   c. broad educational objectives or goals (16).
5. Complexity of Objectives. Discussions of more detailed specification of objectives are usually accompanied by descriptions of a taxonomy of complexity, with objectives being sorted into categories and arranged in a hierarchy. Taxonomies have been presented in detail by Bloom (3), Krathwohl et al. (17), and Eiss and Harbeck (10).*

(18) "Stating Objectives Appropriately for Program, for Curriculum, and for Instructional Material Development."

(16) Behavioral Objectives and Instruction.

(3) Taxonomy of Educational Objectives.

(17) Taxonomy of Educational Objectives: Affective Domain.

(10) Behavioral Objectives in the Affective Domain.

* See Discussion Question G in Part III.

6. Time Frame of Objectives. Objectives may be organized in a hierarchy in which each successive objective can be reached only if the learner has acquired competence in previous objectives. Objectives may vary from immediate, or short-term, to long-range, or life goals.

   Briggs designates four categories for his classification system:
   a. life-long objectives;
   b. end-of-course objectives;
   c. unit objectives;
   d. specific behavioral objectives (4).

7. Comprehensiveness of Objectives. A common source of confusion in statements of objectives is whether statements represent the whole of the desired terminal behavior or only samples or symptoms. Traditional goal statements are usually attempts at delimiting whole goals. The more specific Mager-like statements often tend, like test items, to represent samples.

(4) Handbook of Procedures for the Design of Instruction.

C. Wrapup of Module*

* See Discussion Question H in Part III.

D. Study Activities

Based on your reading of the content outline and any additional references as suggested, complete the following activities.

Objectives in Retrospect

Curriculum theory since 1900 has been greatly concerned with the delineation and clarification of objectives. An early procedure was to analyze the things that adults need to do to live safely and efficiently as individuals and as members of groups. Many of the early formulations were stimulated by the work of Herbert Spencer, who believed that education should function for self-preservation, procuring the necessities of life, rearing one's own children, and performing one's personal culture. Of course, education had objectives, general though they were, far earlier. The Greeks at one time had as the objective of their education the training of superior young men to fight, philosophize, and be gentlemen. The Roman objective was teaching talented youth how to govern. The early Christian schools stressed a knowledge of Christianity (30).

Objectives were neglected or regarded as secondary during the time when faculty psychology and mental discipline held sway. However, the development of educational psychology after 1900 (particularly the work of Thorndike and Woodworth) and the developments in measurement, led to serious doubt about theories concerning separate faculties, mental discipline, and the direct transfer of training. It was then that Spencer's objectives were taken as a point of departure in an attempt to determine objectives scientifically. The procedure was to categorize human behavior into a few important segments, and then to break the categories down into specific objectives by using techniques developed by Bobbitt, Bonser, Charters, and others. Thus, specific objectives were obtained through an analysis of human activity. These objectives were then used to justify the teaching of specific items (30).

About 1925 the statements of objectives began to be selected more on the basis of the needs of students than on the analysis of life activities. This division in the preparation of objectives was to some degree indicative of the split between the "essentialists" and the "progressives." The essentialists could not accept the idea that the interests and needs of children should be relied upon to any great extent in determining what the teacher should teach. They believed that the emphasis should be upon the knowledge, attitudes, and skills that were useful and valuable to children today and that they would need as adults in 10, 20, or 30 years. The progressives, on the other hand, believed that meeting the current needs and interests of children would provide greater opportunities to teach the knowledge, attitudes, and skills needed in adult life. They believed that the mastery of subject matter for which there was no immediate use and no understanding would not only fail to stimulate children but would actually discourage and dishearten them. Men like Counts and Kilpatrick believed that when children work at learning things that lack or appear to lack function, they become discouraged, lose interest, and sometimes become passively or actively rebellious. Originally neither group had the disposition to see any good in the other's position. Between 1940 and 1950, however, a strong movement arose that advocated what has been called student-teacher planning and the cooperative selection of goals by students and teachers working together, and sometimes being joined also by parents and community leaders (30).

Numerous classifications of objectives have existed. In 1918 the Commission on Reorganization of Secondary Education issued its report, Cardinal Principles of Secondary Education. It proposed that the secondary curriculum be divided into constants and electives, or variables. The constants were to be taken by all students, and their content was to be determined by objectives that would have validity for all students. These objectives (areas of living) were: health, command of the fundamental processes, worthy home membership, worthy use of leisure time, vocational efficiency, citizenship, and ethical character.

Since then objectives (and areas of living) have been formulated by various committees and commissions. An outstanding example is Education for All American Youth, issued by the Educational Policies Commission in 1944. It outlined four major objectives of education: the development of the learner; the improvement of home, family, and community life; filfillment of economic needs; and performance of civic and social duties (30).

The budding concern for behavioral outcomes gained impetus from the 1944 report of the American Council on Education, in which the term "performance" was used to imply specific observed outcomes (30).

Since 1950 attempts have been made to state objectives in behavioral terms in such a way as to provide for the subsequent evaluation of the curriculum. These, in turn, were to provide an improved basis for the continuous improvement of content, method, and all other aspects of curriculum. Educational psychologists who sought to measure and assess what the schools were doing had become convinced that if educators could define the goals of the schools clearly in terms of observable behavior, psychologists could construct instruments to measure and, perhaps, to evaluate them. Resultant studies represent broad attempts to scientize the measurement and evaluation of a telic educational program--"telic" because the outcomes are selected ahead of time, stated in terms of specific types of observable behavior, and consciously sought after; and "scientize" because the statements of observable outcomes comprise hypotheses that are to be quantitatively and qualitatively checked. The list of behavior goals set forth in these studies are meant to be of use to teachers, coordinators, principals, superintendents, college teachers, lay leaders, members of parent-teacher associations, and others concerned with curriculum study, improvement, and evaluation (30).

With the 1960s measurable instructional objectives became widely advocated and increasingly used, with the primary impetus provided by the

programmed instruction movement. An example of the effect of this movement is Robert Mager's classic text, Preparing Instructional Objectives, originally titled Preparing Objectives for Programmed Instruction and designed for instructional programmers (designers and developers of programmed instructional materials). Today this text is also accepted by many educators outside of PI circles. According to Popham, "Rarely during the history of education has a book with fewer pages and more white space been as influential on the thinking and practice of American educators. Mager's sixty-two page opus not only contained a very readable message, but it provided the reader with several practical skills--skills which most teachers did not possess. In a field where demonstrable competencies are the exception rather than the rule, it is small wonder that so many educators responded positively to this book" (24).

In a major review article on objectives, Ammons summarized the present state of the art: "Examination of research regarding educational objectives and outcomes reveals several important factors. First, the terms themselves have no universally accepted definition, so discourse about objectives occurs on several levels of generality. Second, a statement of objectives or a recommended methodology for determining objectives is almost always couched in value terms, which renders empirical research in the classical sense difficult. Third, the question of what objectives ought to be sought has a history which dates at least from Plato. Fourth, studies of a largely empirical nature in relation to objectives are few compared to the number of statements of objectives based upon individual or group opinion" (2).

Geis concludes in a brief review and selected bibliography of behavioral objectives: "Ammons' summary is an accurate description of the present state of affairs in this area. Yet it would be a shame if the momentum and forward thrust started by Mager's little book (if the anxiety which may be the motive force of the movement toward more explicit description of educational goals) were blunted or dissipated by

total uncertainty. Of course, that there is great activity and argument in the area of behavioral objectives is not enough to prove that it is an important issue--there may be less than meets the eye. Yet the accumulated wisdom and combined advice of experts ought not be brushed aside....Surely there is a need to find ways to develop effective instruction efficiently and systematically. And there is an equal or greater need to develop instruments which accurately measures students' progress toward goals. Encouraging the teacher and instructional designer to state goals in behavioral terms may be a useful strategy in improving techniques of instruction and evaluation. To the extent the strategy works to produce those ends, it is to be recommended....In the final analysis the movement to operationalize statements of educational goals (of which stating behavioral objectives is a part) is an important part of the growth of a new technology aimed at improving human performance. It is a first step in making more effective, systematic, and rational that most precious, most human activity--teaching others" (14).

1. Read Chapter 5: "Course Objectives" in Mager and Beach, Developing Vocational Instruction. Then complete the following activity.

   From your knowledge of instructional objectives, what do you see as their major importance? Do you agree with the position stated by Mager and Beach? If so, why? If not, why?

Components of an Instructional Objective

Many books have been written on instructional objectives. Most authors, however, define objectives according to Mager's three criteria. According to Mager, an instructional objective states: 1) an action performed by a student; 2) the condition under which the performance is to occur; and 3) the criteria of acceptable performance. For example: "Given a human skeleton (condition), the student must be able to correctly identify by labeling (action) at least 40 of the following bones...(criteria)."

In a similar manner, Kibler et al. (16) define objectives in terms of five components: 1) who is to perform the desired behavior; 2) the actual behavior to be employed in demonstrating mastery of the objectives; 3) the result (that is, the product or performance) of the behavior which will be evaluated (for example, "an essay" or "the speech"); 4) the relevant conditions under which the behavior is to be performed; and 5) the standard that will be used to evaluate the success of the product or performance.

The particular language used in stating the objective is critical. Most authors pay special attention to the verb in the statement of an objective. Such nonobservable verbs as "think," "appreciate," "enjoy," and "know" are considered unacceptable. However, specific, observable action verbs, such as "writes," "assembles," "states" are highly acceptable. Some authors have even provided illustrative lists of such verbs. The National College Verb List provided in this guide is an example.

2. Read Mager's book, Preparing Instructional Objectives. It's a self-instructional book, so be sure to complete the learning activities as you go along. When you have finished, answer the multiple-choice questions below.

   Each of the following items represents a component of an instructional objective. Indicate which component each item represents by marking an "X" at the appropriate choice.

   1. "given an IBM Selectric typewriter and a cartridge-type ribbon"
      _____a. target audience
      _____b. behavior or action
      _____c. condition of performance
      _____d. criterion or standard of performance

2. "graphics arts trainees operating an offset printing press"
   _____a. target audience
   _____b. behavior or action
   _____c. condition of performance
   _____d. criterion or standard of performance

3. "replace automobile front disc brake pads"
   _____a. target audience
   _____b. behavior or action
   _____c. condition of performance
   _____d. criterion or standard of performance

4. "answer correctly 100% of shop safety test questions"
   _____a. target audience
   _____b. behavior or action
   _____c. condition of performance
   _____d. criterion or standard of performance

5. "an allied health trainee with no previous training or experience in medical occupations"
   _____a. target audience
   _____b. behavior or action
   _____c. condition of performance
   _____d. criterion or standard of performance

6. "develop a set of working plans for a mountain cabin"
   _____a. target audience
   _____b. behavior or action
   _____c. condition of performance
   _____d. criterion or standard of performance

7. "given a test bench, an ohmmeter, an electrical circuit, and a diagram"
   _____a. target audience
   _____b. behavior or action
   _____c. condition of performance
   _____d. criterion or standard of performance

8. "complete the task in 10 minutes"
   _____a. target audience
   _____b. behavior or action
   _____c. condition of performance
   _____d. criterion or standard of performance

9. "set a table for a two-course luncheon for four persons, two of whom are children"
   _____a. target audjence
   _____b. behavior or action
   _____c. condition of performance
   _____d. criterion or standard of performance

10. "complete the job at a rate of 1½ acres per hour"
   _____a. target audience
   _____b. behavior or action
   _____c. condition of performanc
   _____d. criterion or standard of performance

11. "using a rolling coulter"
   _____a. target audience
   _____b. behavior or action
   _____c. condition of performance
   _____d. criterion or standard of performance

12. "the retail sales trainee"
   _____a. target audience
   _____b. behavior or action
   _____c. condition of performance
   _____d. criterion or standard of performance

3. Now you should be ready to try writing your own instructional objectives. Use the Task Selection Sheet you developed for Goal 7.1 as a guide. This sheet tells you which tasks you selected for school instruction, and these are the only tasks you need be concerned with in developing instructional objectives. Also refer to the Course Prerequisites Form you prepared for Goal 7.1. This form tells you what knowledge, attitudes, and skills you expect students already to have upon entering your course, so you need not be concerned with writing objectives for behaviors you assume students possess.

   An Objectives Specification Sheet is provided on the next page as an aid in writing your objectives. Enter the vocation and then the specific task you are considering at the top of the sheet; beneath the task, write your objectives describing in more detail what the student will be expected to do at the end of the course in relation to that task. Consider the knowledge, performance skills, and attitudes necessary for accomplishing that task and write objectives in each of these areas if appropriate (a task may not always require objectives in each of these areas).

   You may not have the time to write objectives for each task selected for school instruction. Be sure, however, to complete objectives for at least three tasks. (You will need to prepare an Objectives Specification Sheet for <u>each</u> task. Adequate space is not provided in this guide, so use additional sheets of paper as necessary.)

4. Instructional developers use various forms for preparing their instructional objectives. Did you find the Objectives Specification Sheet useful in organizing the objectives for a given task? If not, why not? If you have found another form that is particularly useful, diagram that form in the space provided below. Then briefly describe its advantages.

OBJECTIVES SPECIFICATION SHEET

Vocation: _____

Task: _____

Cognitive Domain (knowledge)
Psychomotor Domain (performance skills)
Affective Domain (attitudes)

Sources of Existing Objectives

Writing instructional objectives is a time-consuming process. In a real-world situation, you or the individual you are assisting may not have the time to prepare your own. In that case, you have an alternative--to choose from existing objectives.

Several sources exist for ready-made objectives. Curriculum guides and guides accompanying textbooks or other teaching materials may provide objectives. For the most part, however, they tend to be in a more traditional form and do not meet the criteria for measurable instructional objectives.

Specific sets of objectives are available in a great variety of subject matters. The comprehensive bibliography cited below references scores of sets of objectives in areas ranging from foreign languages to performing arts.

> Pouillotte, Carol A., and Peters, Marjorie G., eds. Behavioral Objectives: A Comprehensive Bibliography. Boston, Mass.: Instructional Technology Information Center, Division of Instructional Media, Office of Educational Resources, Northeastern University, 1971.

In addition, the bibliography includes references to published objectives that are available for different academic levels, for example, secondary, community college, special education. Many of these documents are available through the ERIC Clearinghouse system.

Sets of objectives are often part of a book on a specific subject. These may range from a simple treatment consisting of a few sample objectives to a very comprehensive treatment.

Sometimes professional associations interested in education in a specific discipline issue sets of instructional objectives for their area; one example is the National Association of Industrial and Technical Teacher Educators.

Journals devoted to a discipline, such as the Journal of Medical Education or the American Vocational Journal, occasionally include articles which describe specific objectives for an area of their curriculum. The literature on education research--like the Encyclopedia of Educational Research and Review of Educational Research--provides another source of objectives (14).

The Instructional Objectives Exchange (IOX) is a recent and exciting development in this area. In 1968 the UCLA Center for the Study of Evaluation established the IOX as a national depository and development agency for instructional objectives and corresponding measurement items. In 1970 the IOX separated from the Center for the Study of Evaluation and is currently a nonprofit educational corporation.

The IOX performs the following functions:

1. It serves as a visible clearinghouse for current instructional objectives projects throughout the nation.
2. It provides a bank-like facility from which a school district (or comparable educational agency) can draw all the objectives and relevant measures for as many subjects, grades, topics, etc., as desired.
3. It continually updates, refines, and expands the pool of objectives and measures for each field covered by the exchange.

Some of the objectives and measurement items were developed by the IOX staff; others were submitted by teachers, schools, or school districts.

In addition, a quality control system, based on feedback from teachers, is being developed; this in time should add valuable information. More information about the exchange may be obtained by writing:

Instructional Objectives Exchange
Department S
P. O. Box 24095
Los Angeles, California 90025

Another publication worth noting is a handbook on how to write performance objectives, entitled Writing Performance Goals: Strategy and Prototypes (6). Besides providing detailed instructions on how to write performance objectives, it provides prototypes of objectives in six fields of vocational education, including technical education. It also shows how task sequences can be established, with checkup items to determine if they have been performed correctly according to the performance objective.

5. The purpose of this exercise is to give you an opportunity to locate sources of existing objectives for one of the vocational education program areas. From the list of program areas below, select one area and locate five specific sources of instructional objectives for this area.

Vocational Education Program Areas

1. Agricultural Education
2. Distributive Education
3. Health Occupations
4. Home Economics (gainful)
5. Office Occupations
6. Technical Education
7. Trades and Industry

Sources of Instructional Objectives for Program Area Selected

1.

2.

3.

4.

5.

Part III:

Group and Classroom Activities

PART III

GROUP AND CLASSROOM ACTIVITIES

Classroom Activities

NOTE: The following activities are designed for use in the classroom to stimulate discussion on specfic topics covered in this module. The activities are designed to be used following student self-study; however, depending on the background and abilities of students, these activities may not require previous study. All classroom activities are keyed to the content outline to indicate an appropriate point for participation.

1. Prior to class, students should collect a sampling of job descriptions from a variety of local employers, companies, and institutions. Students might select a common occupation from one of the vocational education program areas (agricultural education, distributive education, health occupations, home economics, office occupations, technical education, trades and industry) and collect job descriptions for this occupation.

   In class, discuss the variations in format of the job descriptions collected. What information do some job descriptions give that others do not? If job descriptions contain similar information, how is it handled? For example, do job responsibilities appear as precise behavioral statements ("the jobholder does exactly this"), or are the responsibilities defined in vaguer, more general terms?

2. In class, students should group themselves into pairs. Then each member of the pair interviews the other regarding the specific tasks involved in an occupation at which the individual has worked. Students should note these tasks on a sheet of paper. Afterwards, the entire class discusses the various problems each member experienced in interviewing an individual to determine the specific tasks of an occupation.

The purpose of this activity is to illustrate some of the difficulties involved in determining job tasks by the interview method. If the interviewer is also skilled in the occupation for which he is interviewing a jobholder, the task may be a relatively simple one. (The interviewer may list the tasks of the occupation as he knows them, show the list to knowledgeable persons, and ask whether these listed tasks are actually being performed on the job. They may add to or delete from the list based on their occupational experience.) If the interviewer is not skilled in the occupation for which he is interviewing a jobholder, he would be wise to enlist the services of a person skilled in industrial conference leading who will be able to draw out the job tasks. The skilled leader will be able to determine which tasks are necessary to know in order to gain entry into the occupation as opposed to those tasks which are nice to know but are not initially necessary (26).

3. Students should divide into two teams and debate the issue of whether or not students should be turned away becasue they lack sufficient prerequisites for a course or program.

   There is much controversy in vocational education over the role and purposes of instructional program prerequisites. Some educators argue that all vocational programs should be open to all individuals regardless of their previous background and skills. Others argue that only persons most likely to succeed in an occupation should be allowed to enter training programs for it. Both of these are extreme arguments, and most vocational educators take a position somewhere between. The federal legislation that provides funds for vocational education indicates that the purpose of vocational education is to provide all persons with "...ready access to vocational training or retraining which is of high quality, which is realistic in light of actual or anticipated opportunities for gainful employment, and which is suited to their needs, interests, and ability to benefit from training" (Vocational Education Act of 1963). The underlined portion of this definition is related to the

assessment of prerequisite student skills. Obviously, not all individuals are endowed with equal talent and learning abilities, and such abilities have not all been developed to the same level. It is reasonable to assume, then, that some people who wish to enter a vocational program may not be capable of benefiting from the instruction. On the other hand, educators have shown over the years that most people can benefit from most types of training. The problem facing the instructor or curriculum specialist, therefore, is to determine which skills, knowledge, and work-related attitudes are <u>essential</u> prerequisites for that occupation. No doubt the overall productivity of a vocational program will be increased if people entering the program are highly selected. However, selecting only those who can be maximally successful in the occupation excludes many individuals who can also benefit to some degree from the instruction and, therefore, such a practice is in conflict with the stated purposes of vocational education (26).

These are some of the issues surrounding the problem of whether or not students should be turned away becasue they lack sufficient prerequisites for a course or program. These issues should provide a basis for the class debate.

4. Prior to class, students should interview several vocational instructors regarding the use of instructional objectives in their classrooms. Possible questions students might ask include:

   a. What term do you prefer for objectives? (Answers might include: <u>instructional objectives</u>, <u>behavioral objectives</u>, etc.) Do you use these terms synonymously or does each have a special meaning?
   b. Do you develop your own objectives, rely on existing ones, or do you prefer not to use any objectives at all?
   c. If you develop at least some of your own objectives, what basic components do you use?
   d. What author, if any, do you use as a basis for developing your objectives?
   e. What are your general feelings regarding the importance of objectives?
   f. How do students respond to the use of objectives in your classroom? Do they find them useful or do they find them just another instructional concept with which they have to cope?

In class, students should discuss the results of their interviews and then draw conclusions.

5. In class, students should divide into two teams to debate the value of measurable instructional objectives. One team represents the proponents of objectives and the other team represents the opponents.

   The material in this guide for Goal 7.2 has pointed out some of the reasons for using measurable instructional objectives.

   The students representing the proponents might use these as a basis for their arguments.

   The following list represents some of the usual arguments against the use of measurable instructional objectives. The students representing the opponents might use these as a basis for their arguments:

   a. Trivial learner behaviors are the easiest to operationalize, hence the really important outcomes of education will be underemphasized.
   b. Prespecification of explicit objectives prevents the teacher from taking advantage of instructional opportunities unexpectedly occurring in the classroom.
   c. Besides pupil behavior changes, there are other types of educational outcomes, such as changes in parental attitudes, the professional staff, community values, etc., which are important.
   d. Measurability implies behavior which can be objectively, mechanistically measured, hence the approach tends to be dehumanizing.
   e. It is undemocratic to plan in advance precisely how the learner should behave after instruction.
   f. In certain subject areas, like fine arts and the humanities, it is more difficult to identify measurable pupil behaviors.
   g. Measurability implies accountability; teachers might be judged on their ability to produce results in learners rather than on the many bases now used as indices of competence.

h. It is far more difficult to generate precise objectives than it is to talk about objectives in our customarily vague terms.

i. In evaluating the worth of instructional schemes, it is often the unanticipated results which are really important; pre-specified objectives may make the evaluator inattentive to the unforeseen.

Discussion Questions

A. Can a job description for a specific occupation be used for the preparation of training materials for that occupation?

(Usually not. Typically, a job description does not include the detailed task analysis necessary for the preparation of training materials. However, it does provide a basis for the task analysis.)

B. What is the meaning of the following terms: task analysis, job analysis, occupational analysis? Are these terms synonymous or does each have a specific meaning?

(Most authors use these terms interchangeably, although some have specific meanings for each one. The term job analysis appeared early in vocational and general educational literature and has since caught the attention of people who are interested in curriculum procedures in all fields of education. It also has become a catchword and is used by persons outside of education in connection with work that has no relation to training. In the early stages of its development, job analysis required much detail but lacked clarity. The instructor became confused and burdened in his attempts to follow all the details while instructing. Through the years, however, job analysis has been simplified and its practical usefulness extended. The terms occupational analysis and task analysis represent this modern, streamlined version of what used to be called job analysis.) (12)

C. Should vocational educators rely on job requirements provided by personnel offices for completing a task analysis?

(No. Job requirements provided by personnel offices may be artificial in character, very broadly stated, and not reflect actual job needs.) (26)

D. How do the military criteria for task selection and the Ammerman criteria compare? Can you suggest any other criteria that should be considered in task selection?

(The Ammerman criteria seem to include all the military criteria and more. Ammerman is particularly concerned with the distinction between how a task is actually being performed and how it should be performed.)

E. What are the possible effects on the curriculum if learner abilities and interests are not taken into consideration?

(Certainly the curriculum and education itself cannot be effective and relevant if it does not consider the abilities and interests of students. According to Tyler, most educators recognize the value of using present student interests as a point of departure in developing a curriculum. "Where these interests are desirable ones, they provide the starting point for effective instruction. Where the interests are undesirable, narrow, limited, or inadequate, they indicate gaps which need to be overcome if the student is to receive an effective education.") (28)

F. The issue of the degree of specificity of objectives is a very live one. Various authors propose a wide range of level of precision. The consensus seems to be, however, that the objective should be just specific enough to accomplish the job for which it is designed. Different audiences or functions call for differentially specific objectives. How do certain needs and certain persons determine the level of specificity for objectives?

(For example, with handicapped students, more specific objectives would be appropriate--"Be able to hold a plane." For an apprenticeship student, however, this objective would be too specific--the assumption is made that he would be able to do this; therefore, the objective might be--"Be able to plane an edge.")

G. What limitations, if any, do you see in the uses of taxonomies for identifying and assessing learning outcomes?

(An essential criterion of a taxonomy is the inclusion of terms with commonly accepted usage among professionals. Yet, consider the definition of "knowledge" assumed by Bloom and his associates--the recall of information. Many educators would not accept this definition. Dewey, for example, viewed knowledge as those behaviors which render our action intelligent; he felt that information separated from thoughtful action is a most powerful obstacle to further growth in intelligence. Also consider the hierarchical order of behaviors that the taxonomy assumes: that is, that cognitive learning occurs in a sequential order, from simple to complex behaviors, according to levels of abstractness. This premise does not hold true in real-life situations. If it did, for example, a child would have to know the alphabet before he would be able to speak.)

H. Do you have any problems or concerns regarding this module?

Part IV:

Student Self-Check

PART IV
STUDENT SELF-CHECK

Part A: Knowledge Assessment

GOAL 7.1

1. What U. S. Employment Service publication is a major source of job descriptions for a wide variety of occupations? (7.11)

2. What is the process used to determine the individual steps involved in the completion of a job? (7.12)

3. What are the three major components of a task statement? (7.12)

4. What are four major criteria for selecting a task for which school instruction should be provided? (7.13)

5. What are two criteria for selecting a task for on-the-job training rather than school instruction? (7.13)

6. What are four major characteristics to consider in describing a target population? (7.14)

7. What is the purpose of determining course prerequisites? (7.15)

GOAL 7.2

8. "The concept of instructional objectives arose in the 1960s with the programmed instruction movement." (7.21)

   ____a. True
   ____b. False

   Explain your answer.

9. According to Mager, what are the three major components of an instructional objective? (7.22)

10. Which component of an instructional objective does the following item represent? "Given one standard hospital bed in a patient care unit . . . ." (7.22)

11. Which component of an instructional objective does the following item represent? "Mark any errors in spelling, punctuation, capitalization, grammar, and format . . . ." (7.22)

12. What are three general sources for obtaining existing instructional objectives? (7.24)

Part B: Performance Assessment

The purpose of this part of the test is to assess your ability to perform some of the actual steps involved in the derivation and specification of instructional objectives. You should complete it outside of class and use any reference materials that may be helpful.

This test consists of completing each of the following items in order. As you finish each item, check it off and continue to the next. If you find any of the forms suggested in the Study Guide to be helpful in completing these steps, use them. Otherwise, you may use your own particular forms, as long as you complete each step below as indicated.

_____1. Locate or write a job description for an occupation with which you are familiar or at which you have actually worked. (Select an occupation other than the one you used when completing the exercises in the Study Guide.) (7.11)

_____2. List the tasks involved in actually doing the job you have selected. Be sure your task statements are properly stated. Then indicate the frequency of performance, importance, and learning difficulty for each task. (7.12)

_____3. Select <u>one</u> of these tasks and list the steps involved in performing the task, indicating the learning difficulty of each of these steps. (7.12)

_____4. Of the tasks you listed in Item 2, select those that are appropriate for school instruction. Indicate the reason why you selected each of these tasks for instruction. If you think certain tasks are better handled by on-the-job training or should be completely rejected for either school instruction or OJT, indicate this and state the reasons for your decisions. (7.13)

_____5. Determine the student prerequisites for a course that would provide instruction for the job you selected in Item 1. Use a rating scale to indicate the importance of specific prerequisites. (7.15)

_____6. Develop instructional objectives for <u>three</u> of the tasks you identified for school instruction in Item 4. Be sure to consider the knowledges, performance skills, and attitudes necessary to accomplish that task, and write objectives in each of these areas, if appropriate. (7.23)

Part V:

Appendices

PART V

APPENDICES

Appendix A:

Possible Study Activity Responses

GOAL 7.1

1. (The specific response to this activity depends on the particular occupation you selected. Regardless of the specific occupation, however, a job description is considered adequate when it contains a general statement of each kind of activity a person engages in during his performance of the job, and when it suggests the special or unusual conditions associated with the performance of the job. A job description is usually several paragraphs in length. Pages 8 and 9 of Mager and Beach, Developing Vocational Instruction, provide five examples of job descriptions.)

2. (The specific response to this activity depends on the particular occupation you selected and the corresponding job description in the Dictionary of Occupational Titles. If you were unable to locate a job description in the DOT for the occupation you selected, the reason may have been one of the following:

   (1) The occupation you selected may be a relatively new or emerging occupation not yet included in the DOT.
   (2) The occupation you selected may be obsolete and no longer included in the DOT.
   (3) The occupation you selected may be too specific to a particular community or locale, and therefore not included in the DOT.)

3. (The specific response to this activity depends on the particular occupation you selected. The task listing for this occupation should reflect all the tasks that make up the job. For each task listed, you should have included the following:

   (1) how often each task is performed during the performance of the job;
   (2) the relative importance of the task among all tasks that make up the job;
   (3) the level of difficulty involved for the student in learning how to perform the task.

   Page 15 in Mager and Beach, Developing Vocational Instruction, provides an example of a task listing for the job of electronics technician.)

4. (The specific response to this activity depends on the particular occupation you selected. Your task statements for the occupation should contain the following elements:

   (1) an action verb, indicating what a person does on the job;
   (2) an object, indicating the element which is acted upon by the person doing the job;
   (3) a qualifier (when necessary), indicating the limitations or framework within which the job is performed.

   Page 21 of your guide provides an example of the task statements for the occupation of painter broken down into action verbs, objects, and qualifiers.)

5. (The specific response to this activity depends on the particular occupation you selected. Your Task Detailing Sheet should list each of the steps involved in performing a task; these steps should be expressed in terms of what is done, rather than in terms of what must be known. You should also include those steps that cannot be seen directly, but which are nonetheless important in completing the task. The Task Detailing Sheet should also indicate the learning difficulty of each step, and the likelihood that the student will already be able to perform some of the steps when he arrives for instruction. Pages 21-24 of Mager and Beach, Developing Vocational Instruction, provide examples of Task Detailing Sheets for four specific occupations.)

6. (The specific response to this activity depends on the particular occupation you selected. If you selected a task for school instruction, the reason for your selection should meet at least one of the following criteria:

   (1) The task is performed by a large percentage of the jobholders in this occupation.
   (2) The task is performed frequently.
   (3) The task is critical to job accomplishment.
   (4) The task is essential in performance of another task.
   (5) The task is required immediately upon entry into the job.

   If you selected a task for on-the-job training, the reason for your selection should meet at least one of the following criteria:

   (1) The task is relatively easy to learn.
   (2) The task is performed infrequently.
   (3) The task is performed by a small percentage of jobholders in this occupation.

   If you rejected a task for either school instruction or on-the-job training, the reason for your rejection should meet at least one of the following criteria:

   (1) The task can be performed without further instruction.
   (2) The task is similar to other tasks selected for instruction.)

7. (The specific response to this activity depends on the particular vocational course you selected. In describing the major characteristics of the students in this course, you might have considered the following:

   (1) physical characteristics;
   (2) education;
   (3) motivation;
   (4) interests;
   (5) attitudes, biases, and prejudices;
   (6) specific knowledge, skills, and attitudes relevant to the subject of the course.

   Pages 26 and 27 in Mager and Beach, Developing Vocational Instruction, provide two examples that describe student characteristics in terms of the categories listed above.)

8. (The specific response to this activity depends on the particular occupation you selected. In attempting to determine the prerequisites for a course that provides training for the occupation you selected, you might have considered the following areas:

   (1) physical characteristics;
   (2) learning abilities;
   (3) basic skills;
   (4) work-related attitudes.

   You should have also rated each of your prerequisites as to the degree of their importance. Page 38 of Mager and Beach, Developing Vocational Instruction, provides an example of prerequisites for a course that provides training for a television repairman.)

GOAL 7.2

1. (The literature on instructional objectives is filled with a variety of statements regarding their importance. According to Mager and Beach, objectives are important because:

   (1) they form the basis from which the measuring instrument is prepared by which decisions can be made about the adequacy or inadequacy of student performance upon completion of instruction;
   (2) by knowing course objectives, the student will be better able to organize his own activities and efforts leading him to achieve these objectives;
   (3) objectives provide a document that can be used to demonstrate systematic development of instruction.

   Other statements of importance from the literature include:

   (1) Definitions of objectives are necessary to guide the behavior of the teacher.

(2) Unless the objectives are known, it is impossible to know what the student's capabilities are at any given moment.
(3) An important reason for specifying objectives is so that the terminal behavior which is aimed for can be known to the instructional designer.
(4) Objectives are a convenient way for communicating intended achievements to others (superiors, subordinates, students, parents, etc.).
(5) Objectives increase the probability that the remedy (training, environment changes, motivational systems, etc.) will be relevant to the problem.)

2. 1. c
2. a
3. b
4. d
5. a
6. b
7. c
8. d
9. b
10. d
11. c
12. a

3. (The specific response to this activity depends on the particular occupation you selected. Your instructional objectives should consist of the following parts:

(1) the audience (who is to perform the desired behavior);
(2) the specific action to be performed by the student;
(3) the conditions under which the performance is to occur;
(4) the criteria of acceptable performance.

The form of your objectives is not the important thing--they may be stated in one sentence, in several, or as a list. The important concern is that your instructional intent is clear. Pages 32 and 33 in Mager and Beach, Developing Vocational Instruction, provide examples of objectives in various forms that all contain the essential components for a precisely stated instructional objective.)

4. (The specific response to this activity depends on individual preference.)

5. (The specific response to this activity depends on the particular vocational program area you selected and the specific sources of objectives that you located for this area.)

Appendix B:
Possible Self-Check Responses

Part A: Knowledge Assessment

GOAL 7.1

1. What U. S. Employment Service publication is a major source of job descriptions for a wide variety of occupations? (7.11)

   Dictionary of Occupational Titles

2. What is the process used to determine the individual steps involved in the completion of a job? (7.12)

   Task analysis

3. What are the three major components of a task statement? (7.12)

   (1) Action verb

   (2) Object

   (3) Qualifier

4. What are four major criteria for selecting a task for which school instruction should be provided? (7.13)

   (Consider your answer correct if it includes any four of the following.)

   - The task is performed by a large percentage of jobholders.
   - The task is performed frequently.
   - The task is critical to job accomplishment.
   - The task is essential in performance of another task.
   - The task is required immediately upon entry into the job.

5. What are two criteria for selecting a task for on-the-job training rather than school instruction? (7.13)

   (Consider your answer correct if it includes any two of the following.)

   - The task is relatively easy to learn.
   - The task is performed infrequently.
   - The task is performed by a small percentage of jobholders.

6. What are four major characteristics to consider in describing a target population? (7.14)

   (Consider your answer correct if it includes any four of the following.)

   - Physical characteristics
   - Education
   - Motivation
   - Interests
   - Attitudes, biases, or prejudices
   - Specific knowledge, skills, and attitudes relevant to subject of course

7. What is the purpose of determining course prerequisites? (7.15)

   To determine the abilities (knowledge, attitudes, and skills) that students must possess before entering the learning situation. Prerequisites indicate necessary student abilities for success in a course.

GOAL 7.2

8. "The concept of instructional objectives arose in the 1960s with the programmed instruction movement." (7.21)

   ____a. True

   __X__b. False

   Explain your answer: The concept of instructional objectives dates back to the Greeks and Romans. However, the concept of measurable instructional (behavioral) objectives was widely advocated and increasingly used in the 1960s, with the primary impetus provided by the programmed instruction movement.

9. According to Mager, what are the three major components of an instructional objective? (7.22)

   (1) the behavior or action performed by a student

   (2) the conditions under which the performance is to occur

   (3) the criteria or standards of acceptable performance

10. Which component of an instructional objective does the following item represent? "Given one standard hospital bed in a patient care unit...." (7.22)

    Conditions under which performance is to occur.

11. Which component of an instructional objective does the following item represent? "Mark any errors in spelling, punctuation, capitalization, grammar, and format...." (7.22)

    Behavior or action performed by a student.

12. What are three general sources for obtaining existing instructional objectives? (7.24)

(Consider your answer correct if it includes any three of the following.)

- curriculum guides and guides accompanying textbooks
- behavioral objectives bibliographies
- publications of professional associations: journal articles, or special issues on objectives for specific areas
- the Instructional Objectives Exchange

Part B: Performance Assessment

Personal judgment will be a factor in scoring PART B. However, for the test items indicated below, assessment should consider these specific factors:

Item 2. Task statements should include an action verb, object, and qualifier (if necessary).

Item 4. If a task is selected for school instruction, the reason for selection should be one of the following:

- The task is performed by a large percentage of jobholders.
- The task is performed frequently.
- The task is critical to job accomplishment.
- The task is essential in the performance of another task.
- The task is required immeidately upon entry into the job.

If a task is selected for on-the-job training, the reason for selection should be one of the following:

- The task is relatively easy to learn.
- The task is performed infrequently.
- The task is performed by a small percentage of jobholders.

If a task is rejected for either school instruction or OJT, the reason for the rejection should be one of the following:

- The task can be performed without further instruction.
- The task is similar to other tasks selected for instruction.

Item 5. In determining student prerequisites for entering a course, general areas such as the following should be considered:

- physical characteristics
- learning abilities
- basic skills
- work-related attitudes

Specific prerequisites within these areas should be rated on a scale to indicate the relative importance of each for student success in a course.

Item 6. Instructional objectives should be stated in behavioral terms, that is, observable and measurable. The objectives should have three major components:

- the action or behavior performed by a student
- the conditions under which the performance is to occur
- the criteria or standards of performance

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